

## ABSTRACT OF THE DISCLOSURE

A Schottky barrier photodetector comprises a waveguide structure formed by a thin strip of material having a relatively high free charge carrier density, for example a conductor or  
5 certain classes of highly-doped semiconductor, surrounded by material having a relatively low free charge carrier density, the material on at least one side of the strip comprising a semiconductor, the strip having finite width and thickness with dimensions such that optical radiation couples to the strip and propagates along the length of the strip as a plasmon-polariton wave, light for detection being coupled to one end of the strip to propagate along the strip as said  
10 plasmon-polariton wave, ohmic contact means applied to the semiconductor material and at least one electrode means connected to the strip for applying bias to the Schottky barrier and extracting a photodetector current corresponding to the light applied to the photodetector. Where the strip of material is a flat, thin strip, the device will be polarisation dependent. Substantially polarisation-independent operation may be achieved by using a strip whose width is of the same  
15 order as its thickness.